12-1-1949

Fiftieth and Fifty-First Annual Reports of the Commission of Fisheries of Virginia

Commission of Fisheries of Virginia

FIFTIETH AND FIFTY-FIRST ANNUAL REPORTS

of the

COMMISSION OF FISHERIES OF VIRGINIA

for the

Fiscal Years Ending June 30, 1948 and June 30, 1949

COMMONWEALTH OF VIRGINIA
Division of Purchase and Printing
Richmond
1949

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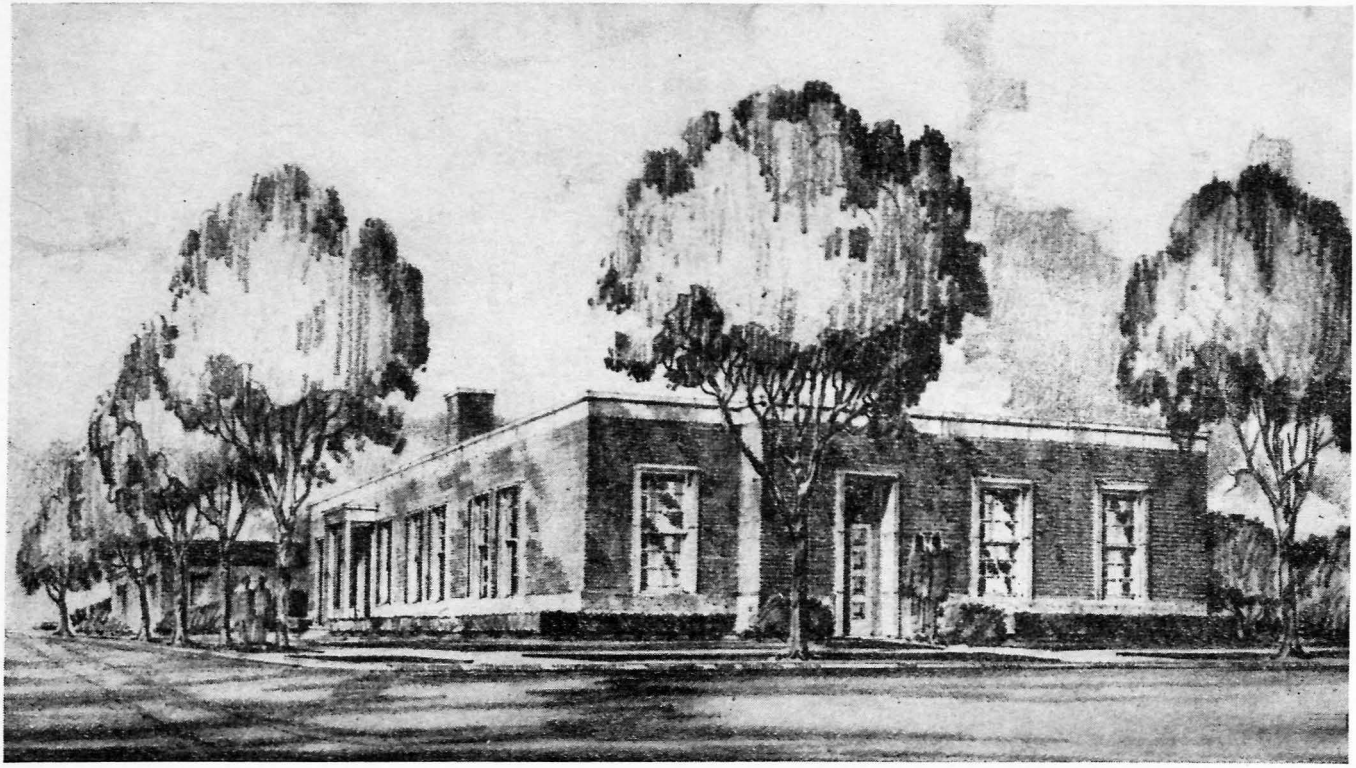


COMMISSION OF FISHERIES BUILDING, NEWPORT NEWS, VA.

COMMISSION OF FISHERIES

CHARLES M. LANKFORD, JR., *Commissioner*.....Franktown, Va.

ASSOCIATE MEMBERS

GEORGE W. LAYMAN.....New Castle, Va.
R. A. EDWARDS.....Isle of Wight, Va.
JAMES B. MARTIN.....Gloucester, Va.
W. COLLIN CHILTON.....Kilmarnock, Va.

OFFICE

WILBUR F. YARRINGTON, *Secretary*
LENA S. COSBY, *Account Executive*
BILLIE T. PHELPS, *Senior Account Stenographer*
STELLA TURLINGTON, *Stenographer*

ADMINISTRATION

GEORGE H. BADGER, JR., *Civil Engineer*.....Newport News, Va.
GEORGE H. BADGER, SR., *Assistant Engineer*.....Newport News, Va.
*J. T. MEYER, *Superintendent of Hatcheries*.....Richmond, Va.

LEWIS JONES, *Attorney*.....Urbanna, Va.

GENERAL OFFICES OF COMMISSION—NEWPORT NEWS, VA.

VIRGINIA FISHERIES LABORATORY

†GLOUCESTER, Va.

NELSON MARSHALL, *Acting Director*.....Yorktown, Va.
JAY D. ANDREWS, *Aquatic Biologist*.....Yorktown, Va.
OLIVE W. CLARK, *Clerk-Stenographer*.....Yorktown, Va.
DENNIS K. COGLE, *Administrative Assistant*.....Williamsburg, Va.
DEXTER S. HAVEN, *Aquatic Biologist*.....Yorktown, Va.
‡WILLIAM H. MASSMAN, *Aquatic Biologist*.....Gloucester Point, Va.
WILLIAM T. ROWE, *Equipment Repair Man*.....Gloucester Point, Va.
R. DASHTI STEINWACHS, *Clerk-Stenographer*.....Yorktown, Va.
WILLARD A. VAN ENGEL, *Aquatic Biologist*.....Yorktown, Va.
JOHN T. WOOD, *Aquatic Biologist Extension Agent*.....Williamsburg, Va.

*Also shown under Inspectors and Boat Captains.
†At present located at Yorktown, Va. Permanent home at Gloucester, Va.
‡Also listed under Boat Captains.

OYSTER INSPECTORS AND DISTRICTS

NAME	ADDRESS	DISTRICT	COUNTIES
R. H. Beale	Hague, Va.	Dist. No. 1 Dist. No. 2	Westmoreland, Northumberland, King George, Prince William, Stafford and Fairfax
E. O. Corsa	Fleeton, Va.	Dist. No. 4	Northumberland
W. N. Gresham	Kilmarnock, Va.	Dist. No. 5	Northumberland and Lancaster
J. E. Blakemore	Ottoman, Va.	Dist. No. 6	Lancaster and Richmond
S. G. Deal	Naxera, Va.	Dist. No. 8	Gloucester
M. H. Hogg	Wicomico, Va.	Dist. No. 9	Gloucester, King and Queen and King William
George E. Brooks	Onemo, Va.	Dist. No. 10	Mathews
J. V. Shipley	Cobbs Creek, Va.	Dist. No. 11	Mathews and Middlesex
Herbert B. Miller	Regent, Va.	Dist. No. 12 Dist. No. 14	Middlesex and Essex
Julian F. Lewis	Cobbs Creek, Va.	Dist. No. 15 Dist. No. 16	York, James City and New Kent
*Julian F. Lewis	Cobbs Creek, Va.	Dist. No. 17	Elizabeth City
*J. Frank Garrow	Denbigh, Va.	Dist. No. 18	Warwick and James City
*P. T. Martin	Rescue, Va.	Dist. No. 19	Isle of Wight and Surry
†J. T. Meyer	Richmond, Va.	Dist. No. 19A	Chesterfield, Henrico, Prince George, Charles City, King William and New Kent
O. A. Richardson	Eclipse, Va.	Dist. No. 20	Nansemond
C. C. Absalom	Norfolk, Va.	Dist. No. 21 Dist. No. 22	Norfolk and Princess Anne
J. C. Bell	Nassawadox, Va.	Dist. No. 24	Accomack and Northampton
John G. Mears	Willis Wharf, Va.	Dist. No. 25	Northampton
Herman Onley	Hallwood, Va.	Dist. No. 26	Accomack
W. D. Steelman	Chincoteague, Va.	Dist. No. 28	Accomack
*A. C. Johnson	Wachapreague, Va.	Dist. No. 29	Accomack
D. L. Mountjoy	Rescue, Va.	James River	

*Also listed under Police Boat Captains.
†Also listed under Administration and Boat Captains.

DEPUTY INSPECTORS AND DISTRICTS

NAME	ADDRESS	DISTRICT	COUNTIES
*W. B. Marchant	Colonial Beach, Va.	Dist. No. 1 Dist. No. 2	Westmoreland, Northumberland, King George, Prince William, Stafford and Fairfax
H. C. Doggett	Monaskon, Va.	Dist. No. 6	Lancaster
James F. Onley	Hallwood, Va.	Dist. No. 26	Accomack
H. C. Ellis	Greenbackville, Va.	Dist. No. 28	Accomack
W. N. Steelman	Chincoteague, Va.	Dist. No. 28	Accomack
Clem Goodman	Lottsburg, Va.	Dist. No. 1 Dist. No. 2	Northumberland and Westmoreland
E. T. Wallace	Hampton, Va.	Dist. No. 15 Dist. No. 16 Dist. No. 17	York, James City and New Kent Elizabeth City

*Also listed under Boat Captains.

AIRPLANE PILOT AND CREW

George H. Colonna, Jr., Pilot.....Johnsontown, Va.
C. E. Charnock, Co-pilot.....Birdsnest, Va.

POLICE BOATS, POLICE BOAT CAPTAINS AND ENGINEERS

Name of Boat	Captain	Engineer	Address
"Will F. Kellam"	R. A. Rew		Onancock, Va.
	J. T. Scott		Onancock, Va.
"Chesapeake"	*J. F. Lewis		Cobbs Creek, Va.
		E. G. Parks	Tangier, Va.
"Potomac"	C. L. Thompson		Cobbs Creek, Va.
"Nomini"	Harry B. Miller		Colonial Beach, Va.
"Dawn II"	†W. B. Marchant		Colonial Beach, Va.
"Rappahannock"	*M. H. Hogg		Wicomico, Va.
"Katie"	A. M. Cross		Weems, Va.
	W. S. James		Weems, Va.
		W. E. Wise	Irvington, Va.
"Ken Di Lai"	*P. T. Martin		Rescue, Va.
"Willisett"	*A. C. Johnson		Wachapreague, Va.
"C. F. 12 Jane"	*J. T. Meyer		Richmond, Va.
"Machipongo"	W. H. Crockett		Willis Wharf, Va.
‡"Virginia Lee"	William H. Massman		Gloucester Point, Va.
"Bonnie"	*J. Frank Garrow		Denbigh, Va.
"Wasp"	F. W. Mears		Nassawadox, Va.

*Also listed under Inspectors.
†Also listed under Deputy Inspectors.
‡This boat is owned by Virginia Fisheries Laboratory and is listed herewith in order to show the entire floating equipment of the two departments.

TEMPORARY EMPLOYEES—USED AT REGULAR INTERVALS

Name	Address	Location of Work
Elizabeth M. Corson	Newport News, Va.	Office
L. R. Dixon	Eclipse, Va.	James River
W. T. Carter	Battery Park, Va.	James River
Frank Marders	Colonial Beach, Va.	Potomac River
B. M. Miller	Colonial Beach, Va.	Potomac River
David Grimes	Menchville, Va.	James River
J. T. Scott	Onancock, Va.	Chesapeake Bay
W. W. Thomas	Severn, Va.	York River

REPORT OF COMMISSION OF FISHERIES

NEWPORT NEWS, VIRGINIA, *October 17, 1949.*

To His Excellency, HONORABLE WILLIAM M. TUCK
Governor of Virginia, and
The General Assembly of Virginia

In accordance with requirements of the Statute Law of Virginia the Commission of Fisheries submits the following report of its operations for the fiscal years ending June 30, 1948, and June 30, 1949.

We report, as required by Section 3146 (15) of the Code of Virginia, the amounts of revenue derived from the fish and shellfish industries under the supervision of the Commission, and also the expenditures of the Commission.

The records in the office at Newport News are open at all times to persons entitled thereto pursuant to Section 3146 (6) of the Code of Virginia.

For the fiscal years designated above the following schedules and exhibits are attached hereto and made a part of this report:

1. Receipts from Fish and Oyster Industries by Districts.
2. General Fund Receipts and Expenditures.
3. Oyster Repletion Fund, Receipts and Expenditures.
4. Boats and Nautical Equipment Fund.
5. List of Recorded Planting Ground.
6. Color and Age of Tongers Licensed.
7. Comparative Statement of Expenses by Years from 1938 to 1949, inclusive.
8. Repletion Work.

Exhibit A.—Report of J. T. Meyer, Superintendent of Hatcheries.

Exhibit B.—Report of Virginia Fisheries Laboratory, Dr. Nelson Marshall, Director.

These schedules and exhibits are self-explanatory, and make it possible to determine, to a reasonable extent, the scope and diversity of Virginia's seafood industry.

Revenues have increased during the past biennium but operating expenses have also increased, out of proportion to collections. This increase in expenses is due to the employment of additional personnel to meet the need and demand for strengthened enforcement activities, merit increases granted employees, higher food costs, added railway bills for old and new boats, and higher costs generally in all departments of the work, in addition to the purchase of a Republic Seabee amphibious airplane, which has been a valuable adjunct to the enforcement work of the Commission. It was accordingly necessary to set up the position of Airplane Pilot and assistant to the pilot in the Department.

During the past biennium, due in large part to the unusual interest of Governor William M. Tuck in the seafood industry, the sum of $100,000 was appropriated from the General Fund for nautical equipment and the repletion of oyster beds. This marks the first time in the history of the Commonwealth that any appropriation for the Commission of Fisheries has been made from the General Fund. Heretofore, the expenditures of the Commission have been confined to actual revenues collected. Hence, the Commission operations have been set up on a basis of anticipated revenue instead of being projected on a basis of the work needed to be done to maintain a proper and adequate program.

STATE BOATS

The General Fund appropriation referred to enabled the Commission to build and equip one new patrol boat, the M/V "Wasp", at a completed cost of approximately $16,000.00. This boat is forty-eight feet long, powered with two Gray Marine engines, 165 h.p. each, and is capable of a speed in excess of twenty miles per hour. Also, there has been installed on this boat a short wave radio set.

From the same appropriation the patrol boat "Ken Di Lai" was purchased for enforcement work in the James River area, and in addition nine of the State patrol boats and the patrol plane have been equipped with short wave radios from the same source.

The value of radio contacts between the boats and the plane can readily be appreciated. When the new Commission office is completed it is anticipated that a radio transmitter and receiver will be installed therein in order that constant contact may be maintained between the office and the boats and plane, so that the exact location of the boats and plane may be known at all times and their activities directed as the needs require.

Present floating equipment owned and operated by the Commission is as follows:

1. The "Chesapeake", stationed at Newport News, used for bay and river patrol work, and powered by two new G. M. Diesel engines, 165 h.p. each;
2. The "Bonnie" and the "Ken Di Lai" that are used in enforcement work in the James River;
3. The "Potomac" assigned to work in Mobjack Bay and the York River;
4. The "Rappahannock" in the upper York River;
5. The "Wasp" and the "Katie" located in the Rappahannock and Piankatank Rivers;
6. The "Nomini" and the "Dawn II" that are on duty in the Potomac River;
7. The "Will F. Kellam" in Tangier and Pocomoke Sounds; and
8. The "Machipongo" and "Willisett" assigned for duty in enforcement work on the sea side of the Eastern Shore of Virginia.

In addition to the foregoing patrol boats owned by the Commission twelve boats are rented from various inspectors, who use said boats in enforcement work in the Rappahannock, Yeocomico, Coan, Piankatank, Great Wicomico, and York Rivers, and in Pocomoke Sound and Chincoteague Bay.

These rented boats are essential to the Commission's enforcement work and it would be far more satisfactory if all boats were owned by the Commission, but lack of funds have prevented the addition of more State-owned boats. It is hoped the General Assembly will make a substantial appropriation from the General Fund for the purchase of needed patrol boats and equipment, the employment of added personnel, and increase of compensation to all personnel in order that more competent persons may be employed for the important work of enforcing the seafood laws of Virginia. It is necessary that the Commission continue to operate better and faster boats as the tongers and dredgers are constantly improving their boats and same are of a different type and much faster than those used by the watermen in former years.

OYSTERS

The demand for oysters has been good and the supply has also remained adequate. In fact Virginia is one State whose oyster supply has continued at a fairly constant level while other states have suffered a decrease in oyster production. This has been due to Virginia's dual system of oyster culture, that of public rocks and private planting. As of June 30, 1949, the acreage of leased oyster ground in Virginia exceeded 100,000 acres, an increase of approximately 12,000 acres during the biennium, and an increase of approximately 33,000 acres or about 50 per cent during the seven-year term of the present Commission.

Tables appended to this report set out the number of bushels of oyster shells planted by the Commission in its repletion program during the biennium, and thus it will be observed that, in spite of prevailing high costs, the repletion activities of the Commission have been at a near peak. This work also was augmented by the General Appropriation Fund referred to previously in this report.

All shell plantings were carried on by the Commission of Fisheries with the advice of and in cooperation with the Virginia Fisheries Laboratory, and these plantings are checked from time to time by the men of the staff of the laboratory in order that the results of these operations may be determined and evaluated.

The oyster drill continues to be a menace to oyster planting in certain areas of the State, especially on the sea side of the Eastern Shore of Virginia.

Special attention is being paid to the James River seed beds, in order to prevent depletion thereof, as it is conceded these seed beds are the most valuable in the entire country.

We believe the repletion work of the Commission has reached such proportions as to merit the employment of a Superintendent of Repletion to supervise same.

It is hoped that the General Assembly will appropriate more funds for the important work of repletion during the next biennium. In the past other states have spent far more for oyster repletion than has Virginia.

In spite of the adverse criticism of certain prophets of doom who talk about what they call the vanishing oyster, we here and now certify that the oyster industry of Virginia is in a prosperous and healthy condition. Further, other jurisdictions realize the future of the oyster industry lies in private leasing of oyster ground and have recommended a leasing program but thus far without avail.

CRABS

We are happy to report an ample supply of crabs and the joint Chesapeake Bay Crab Study Committee, composed of representatives from the U. S. Fish and Wildlife Service, the Chesapeake Biological Laboratory of Maryland and the Virginia Fisheries Laboratory, again advise that no further crab conservation measures are needed for the present.

During the present biennium the crab sanctuary in lower Chesapeake Bay has been laid off and designated by Statute.

The industry continues prosperous and has developed the business of quick freezing crab meat that has increased materially the demand therefor.

FISH

The supply of fish has not been at all satisfactory during the past two years. In fact the present season has been unusually poor. However, this complaint has not been confined to Virginia but is a common one along the entire Atlantic Coast. A few large catches have been reported but the run of fish has not been at all consistent. Studies have been undertaken by the Virginia Fisheries Laboratory, in conjunction with the U. S. Fish and Wildlife Service, in an effort to determine the cause of the fluctuations in the catch of fish from year to year and season to season. Many opinions are voiced by numerous individuals to explain the shortage of fish but thus far they all add up to opinions merely and are without factual data to sustain them.

However, the General Assembly of 1948, again under the leadership of Governor Tuck, adopted a measure, recommended by the Director of the Virginia Fisheries Laboratory and the Commissioner of Fisheries, providing for a hydrographic and biological study of the Chesapeake Bay and its tributaries and all the tidal waters of the Commonwealth, such study to include consideration of the seafood resources of the State and means and methods by which the same might be replenished. We believe this is the most important single step ever taken in Virginia in behalf of the seafood industry. This study is a cooperative one, centered at Johns Hopkins University, undertaken jointly by Maryland, Virginia, the U. S. Fish and Wildlife Service, and the U. S. Navy. When the study is completed and report thereon made we confidently expect to learn the

reason for the fluctuation of the fish population of the Bay area, and then we will have actual facts and figures upon which to base sound conservation measures. At the present we suffer from a woeful lack of information and in the past we have proceeded too often by guess and rule of thumb to seek to regulate an industry that was too important to the people of the State to be regulated by such haphazard methods. For example, it was contended by many for years, both inside and outside the State, that Virginia was destroying the Bay crab industry by its winter dredge fishery. Now, as set out above, it is conceded that no further crab conservation measures are needed; that the winter dredge fishery is not destructive of the industry as has been contended, but that the salinity of the water, the severity of the seasons and other similar factors are what influence the crab population.

Another example of rule of thumb control is the shad fishery. It has been strenuously contended in the past, by even the U. S. Fish and Wildlife Service, that Virginia fishermen were depleting the shad supply by not permitting a sufficient number of fish to escape the nets and go on to the spawning grounds. Virginia authorities have resisted this argument, believing that more information was needed before fishing activities were curtailed. At the annual meeting of the Atlantic States Marine Fisheries Commission in September of this year it was admitted by the U. S. Fish and Wildlife Service that "the shad studies of the Service up to the present time give a great deal of information on total mortality but in their present form and *under interpretations made thus far they give no indication of how much of the mortality is due to fishing intensity*".

This conclusion is directly opposed to that reached by representatives of the same agency in the past.

The easiest way out has been to declare the fluctuations in the fish population to be due to overfishing. However, the Commission of Fisheries has been unwilling to recommend measures that would deprive the watermen of their means of livelihood by prohibiting them to fish as in the past, without adequate information upon which to base such regulations. We think the illustration cited relative to the shad fishery in the Bay justifies the position assumed by the Commission.

In the past the Hudson River shad fishery has been a stock example of what could be accomplished by a limited catch of fish and an escapement as recommended by some authorities. However, in spite thereof, the Hudson River shad catch has declined to an alarming extent and studies have been launched to determine the reason thereof, some now contending such decline is due to pollution but it is conceded that in any event it is not due to fishing intensity.

The schedules appended hereto show results of the shad hatchery operations conducted by the Commission. The results obtained have been satisfactory.

POLLUTION

The problem of pollution is, we think, a vanishing one. The Hampton Roads Sanitation Commission has made important strides toward abating pollution in the Hampton Roads area. Studies are now being conducted to test the results of the Sanitation Commission's work, a joint bacteriological survey by the State and public service being conducted of the waters overlying shellfish growing areas in Hampton Roads to determine the present extent of pollution in said area. The Commission of Fisheries is cooperating in this work.

The State Water Control Board is rendering valuable service in helping to abate pollution in the State. We can envision the time in the not too far distant future when pollution will no longer be a problem in Virginia and valuable oyster ground formerly condemned for use will be restored to production.

ATLANTIC STATES MARINE FISHERIES COMMISSION

This commission continues to serve a most useful purpose to the states along the Atlantic Coast from Maine to Florida. Mr. Wayne D. Heydecker, the efficient Secretary-Treasurer thereof, informs the three Commissioners from each

state of all pending legislation in the Congress that might affect the member states. Also, other information of interest is passed on by him as soon as it is received.

We are happy to report that North Carolina has joined the compact, so that all the coastal states are now members of the Commission.

The Commission meets annually in September, at which time an agenda is prepared covering problems affecting seafood industry along the coast. The panel discussions are valuable. Virginia and Maryland constitute the Chesapeake Bay Panel and this panel has served well in ironing out problems common to these two states. For example, it was through the medium of the Chesapeake Bay Panel that the Bay crab investigation was launched and the problem, we feel, solved.

VIRGINIA FISHERIES LABORATORY

Space does not permit a detailed report on the Laboratory and its work, nor is such necessary, as a comprehensive review thereof by the Director is attached hereto and made a part of this report. We can point with pride to the accomplishments of the laboratory. It was with real regret that the resignation of Dr. Nelson Marshall as Director was accepted. He has rendered valuable service to the Commonwealth during his term as Director. However, Dr. Marshall agreed to continue to serve until his successor is appointed.

The laboratory has been moved from Yorktown to Gloucester Point, where a beautiful site overlooking the York River has been purchased. An appropriation for a laboratory building was made by the General Assembly of 1948 and the contract therefor has been awarded. Virginia will now be in position to conduct proper scientific investigations. The seafood industry is cognizant of the value of the work of the laboratory and has cooperated in a fine way in the program projected by the Director of the laboratory and his fine staff of competent assistants.

A picture of the proposed laboratory building is filed with this report.

OFFICE BUILDING

For many years the Commission of Fisheries has occupied rented quarters in Newport News in a building that was poorly suited to the needs of the Commission. However, once more through the unfailing interest of Governor Tuck, a choice lot was purchased on West Avenue in Newport News and an office building is being erected thereon for use by the Commission, and it should be ready for occupancy before January 1st. This structure is designed to provide adequate space for the work of the Commission and it is the type of building that will reflect credit on the Commonwealth.

LEGISLATION

We will recommend legislation to the General Assembly of 1950 to aid in the proper conservation of Virginia's seafood, recognizing, as we do, the vast importance of this great natural resource to the people of the Commonwealth.

APPRECIATION

We would be recreant to our trust if we did not here and now pay tribute to the great Governor of the great Commonwealth of Virginia for his unflagging interest in the great seafood industry of Virginia. Governor Tuck has never failed to respond to the needs of the Commission and the Virginia Fisheries Laboratory. He has evidenced a knowledge of and interest in the seafood industry unequalled by any of his predecessors. It was due largely to his efforts that appropriations have been made to build a marine laboratory, an office building for the Commission of Fisheries, and to strengthen the enforcement work of

the Commission by the addition of new equipment, together with substantial contributions for repletion of the public oyster rocks.

We further acknowledge our appreciation for the cooperation of the Director and members of the staff of the Virginia Fisheries Laboratory and the loyal employees of the Commission of Fisheries. We also acknowledge with thanks the cooperation received from the members of the seafood industry in Virginia.

Respectfully submitted,

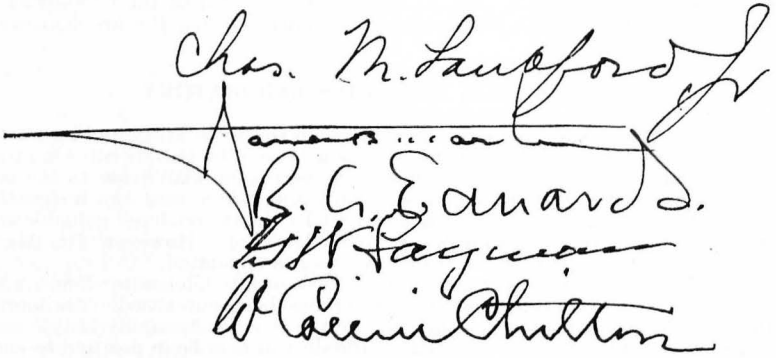


TABLE No. 1

Receipts From Fish and Oyster Industry by Districts

For Year Ending June 30, 1948

DISTRICTS	Ground Rents	Oyster Licenses	Tax From Public Rocks	Tax From Leased Grounds	Tax for Carrying Out of State	Crab Licenses	Clam and Scallop Licenses	Fish Licenses	Fees	Fines	Miscellaneous	Total
1 and 2	$ 4,417 97	$ 1,371 50	$ 997 50	$ 860 30	$ 17 60	$ 2,219 00	.....	$ 2,784 20	$ 155 50	$ 150 00	.....	$ 12,973 57
4	1,725 08	559 50	1,050 43	1,183 73	44 70	842 50	.....	3,451 50	53 50	30 00	.....	8,940 94
5	2,605 11	633 50	.....	.....	.....	699 50	$ 5 50	1,378 00	77 00	.....	.....	5,398 61
6	3,475 77	2,533 50	3,379 75	2,064 58	94 60	1,167 50	.....	953 50	211 00	75 00	$ 58 80	14,014 00
8	5,561 64	243 50	.....	839 29	.....	519 50	67 00	785 50	36 00	.....	198 20	8,250 63
9	3,497 42	530 50	173 66	552 73	.....	105 50	61 50	332 00	77 50	.....	81 25	5,412 06
10	7,073 99	127 50	.....	1,199 83	.....	1,213 00	30 50	853 00	30 00	.....	93 50	10,621 32
11	2,109 33	812 00	224 45	.....	218 22	822 00	.....	483 00	74 50	25 00	62 80	4,831 30
12 and 14	2,368 19	2,234 50	1,588 71	.....	218 00	625 50	.....	1,055 50	192 50	.....	168 25	8,451 15
15 and 16	6,122 47	210 00	.....	.....	.....	791 00	66 50	662 00	40 50	.....	105 50	7,997 97
17	5,263 14	563 50	217 54	1,523 74	380 60	1,637 50	87 00	1,226 00	198 00	115 00	123 50	11,335 52
18	1,933 33	945 00	133 06	.....	266 12	126 00	.....	570 70	360 00	100 00	9 00	4,443 21
19	2,400 12	1,196 50	89 13	408 41	178 26	124 00	.....	581 40	318 00	345 00	25 00	5,665 82
19-A	.....	.....	.....	.....	.....	.....	.....	6,001 20	.....	.....	.....	6,001 20
20	3,465 40	501 00	241 03	414 73	289 50	73 00	.....	355 20	55 50	10 00	36 10	5,441 46
21 and 22	5,247 00	296 50	.....	5,942 19	.....	587 00	.....	546 50	17 50	.....	53 75	12,690 44
24	5,614 99	174 50	.....	410 83	.....	871 00	43 50	698 50	47 00	.....	238 25	8,098 57
25	4,360 48	770 50	.....	1,960 53	.....	682 00	186 00	96 50	17 00	.....	74 25	8,147 26
26	1,048 65	513 00	310 56	368 13	177 46	735 00	.....	549 00	76 50	440 00	137 00	4,355 30
28	4,844 46	330 50	.....	1,465 95	.....	323 00	554 50	46 00	14 00	50 00	59 60	7,688 01
29	2,595 81	252 50	.....	519 20	.....	102 00	30 00	70 00	16 00	.....	128 10	3,713 61
Office	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,950 00	1,950 00
W. C. Allen	.....	591 50	140 98	.....	281 96	1,616 00	.....	163 00	81 50	520 00	.....	3,394 94
C. L. Thompson	.....	241 50	.....	.....	.....	417 00	75 00	339 50	24 00	20 00	.....	1,117 00
C. E. Charnock	.....	.....	.....	.....	.....	.....	.....	.....	.....	35 00	.....	35 00
Totals	$ 75,730 35	$ 15,632 50	$8,546 80	$ 19,714 17	$2,167 02	$ 16,298 50	$1,207 00	$ 23,981 70	$2,173 00	$1,915 00	$3,602 85	$170,968 89

TABLE No. 1—Continued

Receipts From Fish and Oyster Industry by Districts

For Year Ending June 30, 1949

DISTRICTS	Ground Rents	Oyster Licenses	Tax From Public Rocks	Tax From Leased Grounds	Tax for Carrying Out of State	Crab Licenses	Clam and Scallop Licenses	Fish Licenses	Fees	Fines	Miscellaneous	Total
1 and 2	$ 4,483 24	$ 1,394 50	$1,043 04	$ 649 96	$ 3 00	$ 2,132 00	.....	$ 3,033 40	$ 146 50	$ 150 00	.....	$ 13,035 64
4	2,507 76	548 00	889 77	1,171 80	41 00	776 50	.....	4,180 30	57 00	.....	$ 162 25	10,334 38
5	2,998 94	714 00	.....	.....	.....	762 00	.....	1,162 50	72 00	.....	.....	5,709 44
6	3,713 24	3,158 50	2,920 14	2,037 32	198 84	1,610 00	.....	1,089 35	275 50	180 00	18 75	15,201 64
8	6,381 68	299 00	134 11	1,122 38	.....	964 50	$ 75 50	586 00	52 00	10 00	300 95	9,926 12
9	3,459 21	556 00	327 11	398 72	.....	290 00	41 00	333 00	77 00	.....	40 00	5,522 04
10	8,656 20	198 50	.....	751 70	.....	1,183 00	20 50	829 00	30 00	.....	463 20	12,132 10
11	2,178 16	931 00	273 68	16 63	156 00	867 00	.....	496 00	95 50	.....	56 00	5,069 97
12 and 14	2,374 69	2,417 50	1,779 75	.....	195 62	486 00	.....	1,050 00	209 00	20 00	53 00	8,585 56
15 and 16	6,761 73	.....	.....	.....	.....	.....	.....	25 50	19 00	.....	203 75	7,009 98
17	5,266 11	791 50	253 85	1,868 73	324 00	2,899 00	122 00	1,007 00	135 00	90 00	55 25	12,812 44
18	1,917 70	1,638 00	266 31	.....	532 62	172 50	.....	759 40	489 00	115 00	15 75	5,906 28
19	2,481 11	1,259 00	309 27	574 62	394 00	175 00	.....	617 80	793 50	515 00	.....	7,119 30
19-A	.....	.....	.....	.....	.....	5 00	.....	5,438 40	.....	.....	.....	5,443 40
20	3,587 64	487 00	86 57	222 28	.....	46 00	.....	237 90	44 50	10 00	90 70	4,812 59
21 and 22	5,316 82	298 50	.....	5,323 39	826 94	466 50	.....	514 00	24 50	.....	125 50	12,896 15
24	6,152 94	67 50	.....	313 25	.....	894 50	43 50	636 50	31 00	330 00	318 40	8,787 59
25	4,311 99	732 00	1,217 87	798 84	.....	733 50	150 50	106 50	15 00	.....	140 00	8,206 20
26	1,605 60	672 50	376 08	206 17	156 22	728 00	.....	436 50	86 00	150 00	113 80	4,530 87
28	4,794 89	513 00	19 00	2,147 74	38 00	561 50	350 50	72 50	23 00	.....	127 35	8,647 48
29	2,744 34	399 00	.....	564 79	.....	179 50	18 00	65 00	25 00	.....	189 00	4,184 63
Office	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	606 00	606 00
W. C. Allen and R. A. Rew	.....	98 00	54 35	.....	108 70	1,640 50	.....	139 50	18 00	410 00	.....	2,469 05
C. L. Thompson	.....	31 50	.....	.....	.....	596 00	93 50	504 70	4 50	.....	.....	1,230 20
Seaplane	.....	.....	.....	.....	.....	.....	.....	.....	.....	365 00	.....	365 00
Totals	$ 81,693 99	$ 17,204 50	$9,950 90	$ 18,168 32	$2,974 94	$ 18,168 50	$ 915 00	$ 23,320 75	$2,722 50	$2,345 00	$3,079 65	$180,544 05

TABLE No. 2

General Fund

Receipts and Expenditures

	Year Ending June 30, 1948		Year Ending June 30, 1949	
Amount to the credit of the General Fund at the beginning of the year		$ 36,735 42		$ 15,030 43
Receipts:				
Ground rents	$ 75,730 35		$ 81,693 99	
Oyster tongers licenses	5,901 00		6,787 50	
Other oyster licenses	2,584 50		2,144 00	
20% oyster tax from public rocks	1,709 36		1,990 20	
20% oyster tax from leased grounds	3,942 84		3,633 66	
Tax on oysters carried out of State	2,167 02		2,974 94	
Crabbing licenses	16,298 50		18,168 50	
Clam and scallop licenses	1,207 00		915 00	
Food fish licenses	20,764 70		18,975 75	
Menhaden fish licenses	3,217 00		4,345 00	
Fees and permits	2,173 00		2,722 50	
Sale "Agnes Hope"	1,650 00		0	
Sale engine "Bonnie"	150 00		0	
Sale engine "Dawn II"	150 00		0	
Sale engine "Will F. Kellam"	0		300 00	
Sale engine "Katie"	0		25 00	
Sale engine "Potomac"	0		250 00	
Sale battery "Chesapeake"	0		25 00	
Sale battery "Chesapeake"	0		6 00	
Miscellaneous	1,652 85		2,473 65	
		139,298 12		147,430 69
Sale oysters from boat "Duke"		0		6 00
Confiscated boat "Duke"		0		5,000 00
Deficiency Authorization D-299		0		6,039 05
Deficiency Authorization D-319		0		1,827 91
Total receipts		$ 176,033 54		$ 175,334 08
Fines to Literary Fund				
Expenditures—Administration:				
Salaries:				
Commissioner	$ 6,780 00		$ 7,500 00	
Other members of Commission	610 00		580 00	
Clerks and stenographers	8,052 00		9,234 00	
Wages, extra office help, etc	946 26		1,077 70	
Counsel and expert services	1,350 00		1,395 00	
General repairs	174 94		8 99	
Light, heat, power and water	68 36		57 96	
Traveling	1,787 80		1,495 66	
Transportation	1 86		5 26	
Communications	1,196 74		1,259 58	
Printing	27 38		9 00	
Other expense	62 60		85 70	
Office supplies	246 94		247 53	
Medical and laboratory supplies	0		29	
Laundry, cleaning and disinfecting supplies	60		1 78	
Motor vehicle supplies	19 86		7 85	
Other supplies	2 07		3 30	
Rent	998 00		1,087 00	
Insurance	62 47		155 18	
Other charges and obligations	249 02		257 98	
Office equipment—Capital outlay	291 20		0	
Other equipment—Capital outlay	10 00		22 00	
		$ 22,938 10		$ 24,491 76
Expenditures—Inspection and Policing:				
Salaries:				
Boat crews	$ 19,759 00		$ 20,779 70	
Inspectors and special police	45,137 10		49,953 60	
Civil engineers	4,902 24		5,532 00	
Wages	5,669 75		8,859 60	
Counsel and expert service	551 95		350 00	
General repairs	151 38		174 38	
Motor vehicle repairs	11,699 80		5,205 77	
Light, heat, power and water	12 39		12 50	
Traveling	6,689 45		7,088 75	
Transportation	41 41		237 51	
Communication	915 05		1,111 04	
Printing	1,628 15		2,477 25	
Other expense	584 95		890 42	

TABLE No. 2—CONTINUED

	Year Ending June 30, 1948		Year Ending June 30, 1949	
Expenditures—Inspection and Policing —Continued				
Food supplies	$ 4,419 54		$ 4,434 18	
Fuel supplies	338 51		365 25	
Office supplies	146 71		53 10	
Medical and laboratory supplies	35 30		40 94	
Laundry and cleaning supplies	80 73		193 46	
Refrigerating supplies	186 85		184 53	
Motor vehicle supplies	6,998 32		6,865 52	
Wearing apparel	20 30		1 73	
Other supplies	531 29		183 27	
Other materials	7 05		174 05	
Office equipment	138 30		0	
Household equipment	564 51		295 47	
Medical and laboratory equipment	0		117 00	
Motorless vehicle equipment	159 75		0	
Motor vehicle equipment	427 57		0	
Boats and nautical equipment	3,506 64		1,275 94	
Rent	5,346 00		5,012 50	
Insurance	2,614 42		5,992 23	
Other charges and obligations	2,668 28		2,855 63	
Office equipment (capital outlay)	1,168 90		125 00	
Household equipment (capital outlay)	34 90		0	
Motor vehicle equipment (capital outlay)	4,550 00		0	
Boats and nautical equipment—Capital outlay	6,378 52		0	
		$ 138,065 01		$ 130,842 32
Site for office building		0		20,000 00
Total expenditures		$ 161,003 11		$ 175,334 08
Balance in General Fund		$ 15,030 43		$ 0

TABLE No. 3

OYSTER REPLETION FUND

Receipts and Expenditures, Years Ending June 30, 1948 and 1949

RECEIPTS	1948	1949
Amount to the credit of Repletion Fund at beginning of year	$ 24,280 70	$ 3,359 48
Receipts for:		
Tonging Licenses—Ordinary and patent	7,147 00	8,273 00
80% tax on oysters from public rocks	6,837 44	7,960 70
80% tax on oysters from leased grounds	15,771 33	14,534 66
	$ 54,036 47	$ 34,127 84
Deficiency Authorization D-319	0	5 29
Deficiency Authorization D-295	0	8,500 00
Total receipts	$ 54,036 47	$ 42,633 13
EXPENDITURES		
Wages, tallying and planting shells	$ 664 30	$ 1,758 85
General repairs	51 27	0
Motor vehicle repairs	0	30
Traveling	787 69	827 58
Transportation	2,525 82	1,530 80
Communication	10 35	3 01
Printing	75 22	157 23
Other expense, purchase of shells, etc	43,923 81	35,233 71
Food supplies	2 15	231 73
Fuel supplies	0	1 90
Laundry and cleaning supplies	0	1 82
Refrigerating supplies	1 95	2 65
Motor vehicle supplies	484 53	2,086 60
Other supplies	0	95
Rent	1,105 00	796 00
Insurance	462 50	0
Office equipment (capital outlay)	582 40	0
Total expenditures	$ 50,676 99	$ 42,633 13
Balance in Oyster Repletion Fund	$ 3,359 48	$ 0

TABLE No. 4

Boats and Nautical Equipment Fund

	Year Ending June 30, 1948	Year Ending June 30, 1949
Receipts		
Amount to credit of Fund at beginning of year (Appropriation Act, Item 608)	$ 0	$ 100,000 00
Expenditures		
Capital Outlays:		
Equipment replacement	$ 0	$ 21,256 65
New equipment	0	19,407 53
		$ 40,664 18
Transferred to Oyster Repletion Fund	0	8,500 00
Total expenditures	0	$ 49,164 18
Balance in Boats and Nautical Equipment Fund	$ 0	$ 50,835 82

TABLE No. 5

Recorded Planting Ground

Years Ending June 30, 1948, and June 30, 1949

DISTRICTS	1948 Number of Acres	1949 Number of Acres
1	1,802.05	1,802.05
2	2,617.54	2,711.44
4	1,680.89	3,181.52
5	4,136.18	4,751.42
6	3,443.91	3,617.56
8	8,471.85	9,500.21
9	3,477.50	3,503.26
10	11,807.02	14,735.93
11	2,090.34	2,157.30
12	253.76	264.22
14	2,129.84	2,127.85
15	4,575.90	5,282.17
16	3,413.29	3,392.94
17	5,173.11	5,208.66
18	1,792.26	1,812.12
19	2,450.81	2,450.81
20	3,446.25	3,622.54
21	6,272.11	5,934.83
22	2,118.56	2,370.30
24	5,591.45	6,299.96
25	4,377.39	4,197.04
26	1,102.18	1,492.11
28	4,959.02	4,981.37
29	2,603.47	2,784.95
Totals	89,786.68	98,182.56

TABLE No. 6

Table of Color and Age of Tongers Who Procured a License to Tong Oysters, Clams and Scallops

For Year Ending June 30, 1948

	Ages in Years										
	20 or Under	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51 to 55	56 to 60	Over 60	Total
White	131	193	218	261	263	227	229	184	204	218	2,128
Colored	40	85	142	135	156	124	132	115	98	145	1,172
Totals	171	278	360	396	419	351	361	299	302	363	3,300

Table of Color and Age of Tongers Who Procured a License to Tong Oysters, Clams and Scallops

For Year Ending June 30, 1949

	Ages in Years										
	20 or Under	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51 to 55	56 to 60	Over 60	Total
White	129	222	284	281	274	277	287	208	212	252	2,426
Colored	66	97	152	138	169	141	150	139	102	189	1,343
Totals	195	319	436	419	443	418	437	347	314	441	3,769

TABLE No. 7

Comparative Statement of Expenses by Years

From July 1, 1938 to June 30, 1949

	Office and Administration	Field Inspection	Boats and Nautical Equipment	Total Expenses
Expenses, July 1, 1938 to June 30, 1939*	$ 18,898 62	$103,528 15*		$122,426 77
Expenses, July 1, 1939 to June 30, 1940†	20,686 77†	90,824 14		111,510 91
Expenses, July 1, 1940 to June 30, 1941	19,503 21	88,343 40		107,846 61
Expenses, July 1, 1941 to June 30, 1942	22,034 53	83,606 36		105,640 89
Expenses, July 1, 1942 to June 30, 1943	18,984 43	70,957 27		89,941 70
Expenses, July 1, 1943 to June 30, 1944	18,244 88	81,494 97		99,739 85
Expenses, July 1, 1944 to June 30, 1945‡	20,208 21‡	84,399 48		104,607 69
Expenses, July 1, 1945 to June 30, 1946	20,522 69	109,018 75		129,541 44
Expenses, July 1, 1946 to June 30, 1947	21,081 93	116,066 87		137,148 80
Expenses, July 1, 1947 to June 30, 1948¶	22,938 10	138,065 01¶		161,003 11
Expenses, July 1, 1948 to June 30, 1949§	44,491 76§	130,842 32	$ 49,164 18	224,498 26

*New boat purchased this year.
†The salary of the Commissioner was reduced from $5,500.00 to $5,000.00 per annum.
‡The salary of the Commissioner was increased to $6,000.00 per annum.
¶Seaplane and new bookkeeping machine purchased during this period.
§$20,000.00 of Administration Fund transferred to Building Fund to purchase site for office building. Also during this period radiotelephones were installed in boats.

TABLE No. 8

Statement of Oysters and Shells Planted

During Fiscal Year Ending June 30, 1948

Eastern Shore

70	bu. shells planted head Channel Rock, Bradford's Bay	$	5 60
2,000	bu. shells planted Northeast Cove, Cedar Island Bar		160 00
2,070	bushels	Total amount	$ 165 60

York River Area

1,875	bu. shells planted in Mobjack Bay	$	112 50
21,553	bu. shells planted in Severn River		1,293 18
3,660	bu. shells planted in Poquoson River		219 60
6,955	bu. shells planted in York River		417 30
1,020	bu. shells planted in Ware River		153 00
6,780	bu. shells planted in Severn River		1,017 00
10,195	bu. shells planted in York River, Rock No. 30		1,529 25
52,038	bushels	Total amount	$ 4,741 83

Great Wicomico River

18,842	bu. shells planted on Stoney Bar	$	2,261 04
8,584	bu. shells planted on Fleets Point Bar		1,201 76
16,916	bu. shells planted on Haynie's Bar		2,368 24
3,220	bu. shells planted on Middle Ground		450 80
1,600	bu. shells planted on Debbs		224 00
49,162	bushels	Total amount	$ 6,505 84

Little River

500	bu. shells planted in Little River	$	60 00
500	bushels	Total amount	$ 60 00

Rappahannock River

	Supplemental price of shells @ .01	$	268 00
9,600	bu. shells planted at Grays Point		960 00
17,600	bu. shells planted in Temples Bay		1,760 00
19,124	bu. shells planted at Hog House		1,912 40
26,000	bu. shells planted on Drumming Ground		2,600 00
4,000	bu. shells planted on Towles Flats		400 00
76,324	bushels	Total amount	$ 7,900 40

Lower Machodoc Bay

30,155	bu. shells planted on public bottom known as Peach Orchard	$	3,015 50
5,880	bu. shells planted on public bottom known as Peach Orchard		588 00
36,035	bushels	Total amount	$ 3,603 50

TABLE No. 8—CONTINUED

PIANKATANK RIVER

9,600	bu. shells planted on Pallas Bar, Lower Edge	$ 1,152 00
8,800	bu. shells planted on Three Branch Shore	1,056 00
8,400	bu. shells planted near Hole in Wall, Milford Haven	1,008 00
3,200	bu. shells planted on Treakle's Rock, Milford Haven	384 00
30,000	bushels Total amount	$ 3,600 00

CURRIOMAN BAY

10,032	bu. shells planted on public bottom	$ 1,003 20
10,032	bushels Total amount	$ 1,003 20

Total amount spent for shells for Eastern Shore and Western Shore.... $27,580 37

380½ gals. screw borers were caught and destroyed during this period at a cost of.... $ 380 50

TABLE No. 8—CONTINUED

STATEMENT OF OYSTERS AND SHELLS PLANTED

During Fiscal Year Ending June 30, 1949

		PIANKATANK RIVER	
9,600	bu.	shells planted on lower edge of Jenney's Point	$ 1,152 00
17,600	bu.	shells planted on Herring Rock	2,112 00
3,200	bu.	shells planted on Ferry Point	384 00
4,800	bu.	shells planted on Covington Ridge	528 00
35,200	bushels	Total amount	$ 4,176 00
		GREAT WICOMICO RIVER	
8,000	bu.	shells planted on Haynie's Bar	$ 1,120 00
3,200	bu.	shells planted on Middle Ground above bridge	448 00
8,000	bu.	shells planted on Fleets Point Bar	1,120 00
3,200	bu.	shells planted on Middle Ground above Mila	448 00
22,400	bushels	Total amount	$ 3,136 00
		EASTERN SHORE	
2,400	bu.	shells planted Northeast Cove, Cedar Island Bay	$ 240 00
2,400	bushels	Total amount	$ 240 00
		MACHODOC BAY	
25,000	bu.	shells planted at Peach Orchard	$ 2,500 00
11,316	bu.	shells planted at Peach Orchard	1,131 60
26,730	bu.	shells planted on West Stoney Bar	2,673 00
63,046	bushels	Total amount	$ 6,304 60
		RAPPAHANNOCK RIVER	
7,560	bu.	shells planted on Parrotts Rock	$ 831 60
9,664	bu.	shells planted on Middle Ground	1,063 04
17,696	bu.	shells planted on Cedar Bar	1,946 56
9,600	bu.	shells planted in Roges Hole	960 00
11,200	bu.	shells planted at Spikes	1,232 00
4,800	bu.	shells planted at Butlers Hole	528 00
2,956	bu.	shells planted on Cedar Bar	325 16
3,200	bu.	shells planted off Beach Creek	352 00
10,300	bu.	shells planted on Weeks Bar	1,030 00
20,118	bu.	shells planted on Bluff, off Airport	2,011 80
10,000	bu.	shells planted on Piney Island	1,000 00
107,094	bushels	Total amount	$11,280 16
		CURRIOMAN BAY	
10,000	bu.	shells planted in Currioman Bay	$ 1,000 00
10,000	bushels	Total amount	$ 1,000 00
		NANSEMOND RIVER	
12,050	bu.	shells planted on Drum Shoals	$ 1,144 75
12,050	bushels	Total amount	$ 1,144 75

TABLE No. 8—CONTINUED

	JAMES RIVER	
18,145	bu. shells planted on Jail Island	$ 2,177 40
18,145	bushels Total amount	$ 2,177 40
	EAST RIVER	
10,000	bu. shells planted on public ground	$ 1,000 00
10,000	bushels Total amount	$ 1,000 00
	SEVERN RIVER	
10,000	bu. shells planted in Northwest Branch	$ 1,000 00
10,000	bushels Total amount	$ 1,000 00
	WARE RIVER	
5,000	bu. shells planted in Ware River	$ 500 00
5,000	bushels Total amount	$ 500 00
	NOMINI CREEK	
3,837	bu. shells planted in Buckner's Creek	$ 383 70
9,651	bu. shells planted in Buckner's Creek	965 10
13,488	bushels Total amount	$ 1,348 80
	YEOCOMICO RIVER	
9,600	bu. shells planted on public ground No. 100 and No. 102	$ 960 00
8,400	bu. shells planted on Bam Point Rock	924 00
18,000	bushels Total amount	$ 1,884 00
Total amount spent for shells for Eastern Shore and Western Shore		$35,191 71
1,343½	gals. screw borers were caught and destroyed during this period at a cost of	$ 1,343 50

EXHIBIT A

1948 REPORT OF SUPERINTENDENT OF HATCHERIES

RICHMOND, VIRGINIA, *October 25, 1948.*

HON. CHARLES M. LANKFORD, JR., *Commissioner*
Commission of Fisheries of Virginia
Newport News, Virginia

DEAR MR. LANKFORD:

I submit herewith my report covering the shad hatching work on the Chickahominy, Mattaponi and Pamunkey Rivers for the season 1948, as follows.

The Chickahominy River Hatchery was in operation from April 10th to May 19th, inclusive, during which time one hundred and twenty-eight (128) spawning roe shad were caught and stripped, from which we received a total of 1,325,000 eggs.

The Mattaponi River Hatchery was in operation from April 12th to May 19th, inclusive, during which time forty-six (46) spawning roe shad were caught and stripped, from which we received a total of 690,000 eggs.

The Pamunkey River Hatchery was in operation from April 10th to May 21st, inclusive, during which time ninety-eight (98) spawning roe shad were caught and stripped, from which we received a total of 1,617,000 eggs.

From the above total of 3,632,000 eggs, we received a hatch of about 80 per cent. All young shad were immediately released in the rivers named above.

The number of eggs collected and hatched this season shows a total of 1,632,000 eggs less than the number collected and hatched last season. Said decrease in the number of shad caught and the decrease in the number of eggs produced was due to the extremely cool weather we experienced during the entire hatching period and the spawning roe shad that were caught this season produced far less eggs than those caught during the last season.

Floating boxes for holding eggs during incubation period, which were borrowed from the State of Maryland, were used this season on both the Mattaponi and Pamunkey Rivers and proved very satisfactory.

Since the floating boxes have proved to be successful in our waters and the State of Maryland finding them unsuccessful in their waters, I will take the matter up with the Maryland authorities as to purchasing the boxes which I now have on hand and any other boxes that they may desire to dispose of. I feel that said boxes can be secured from them far cheaper than we could have them constructed.

We will have to use the floating boxes on the Mattaponi River until such a time as we deem it proper to erect a hatchery on this river.

The run of shad on all three of the above named rivers was very good this season and all fishermen seemed well pleased with their catch.

Trusting that this report meets with your approval and with best regards, I am,

Yours most sincerely,

J. T. MEYER,
Superintendent of Hatcheries.

1949 REPORT OF SUPERINTENDENT OF HATCHERIES

RICHMOND, VIRGINIA, *August 4, 1949.*

HON. CHARLES M. LANKFORD, JR., *Commissioner*
Commission of Fisheries of Virginia
Newport News, Virginia

DEAR MR. LANKFORD:

I submit herewith my report covering the shad hatching work on the Chickahominy, Mattaponi and Pamunkey Rivers for the season 1949, as follows.

The Chickahominy River Hatchery was in operation from April 11th to May 20th, inclusive, during which time one hundred and twenty-two (122) spawning roe shad were caught and stripped, from which we received a total of 1,077,000 eggs.

The Mattaponi River Hatchery was in operation from April 13th to May 20th, inclusive, during which time sixty-nine (69) spawning roe shad were caught and stripped, from which we received a total of 1,215,000 eggs.

The Pamunkey River Hatchery was in operation from April 11th to May 23rd, inclusive, during which time ninety-five (95) spawning roe shad were caught and stripped, from which we received a total of 1,748,000 eggs.

From the above total of 4,040,000 eggs we received a hatch of about 80 per cent. All young shad were immediately released in the rivers named above.

The number of eggs collected and hatched this season shows an increase of 408,000 over the number collected and hatched last season. We experienced another rather cool spell during the hatching season and the large run of shad came during the cool weather, which again cut down the number of spawning roe shad caught and also the number of eggs which they produced. If the weather had been warm during the time of the large run of shad, we would have naturally received a larger number of eggs.

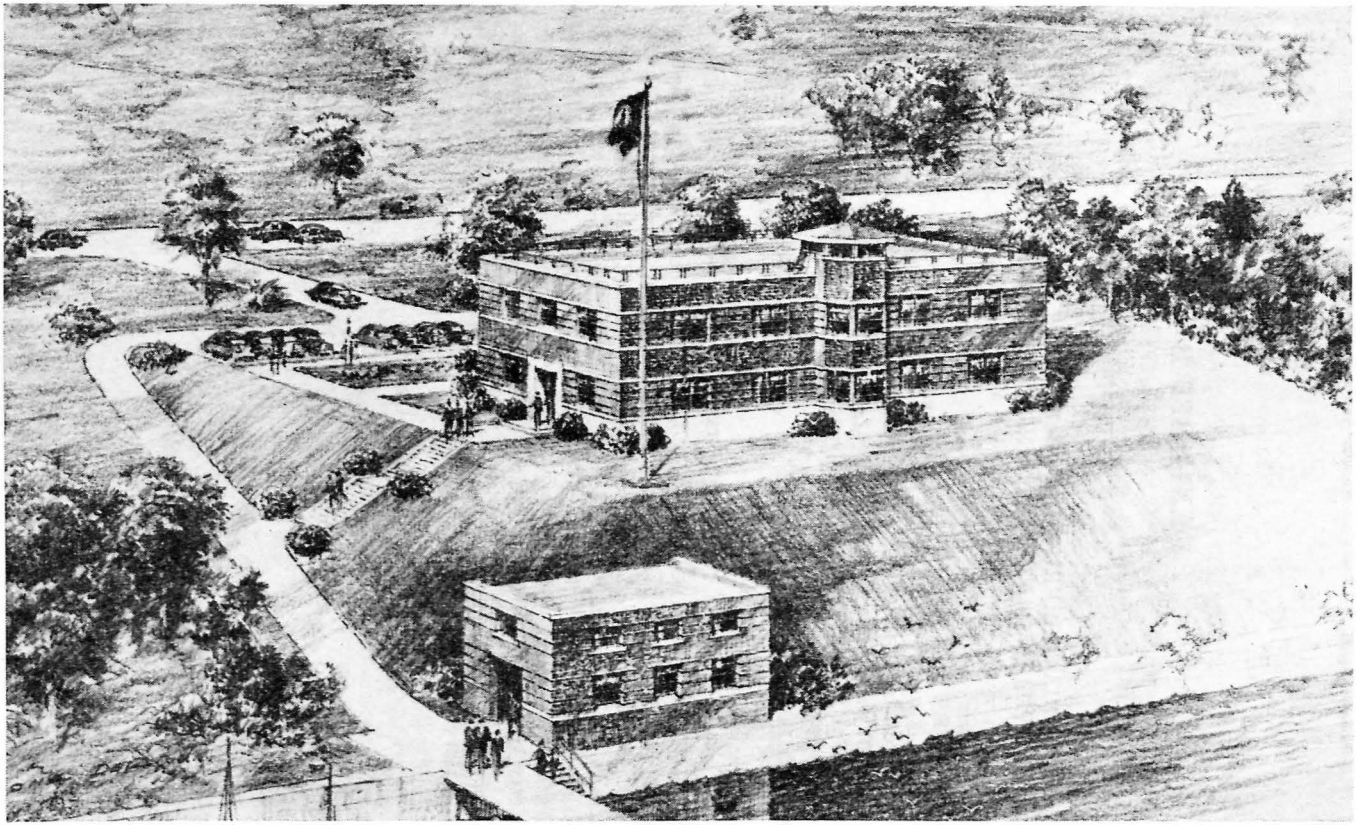
During the past season we used the floating boxes for holding eggs during the incubation period on all three of the rivers and they proved very satisfactory.

I am very sorry to report that Mr. Raymond D. Hazelwood, who has been operating the Chickahominy River Hatchery for the past several years, was killed in an automobile accident during the 4th of July holidays. He was a very efficient worker and his death will mean quite a loss.

Trusting that this report meets with your approval and with best regards, I am,

Yours most sincerely,

J. T. MEYER,
Superintendent of Hatcheries.



COURTESY ROBERT J. LEARY, A. I. A., RICHMOND, VIRGINIA.

ARTIST'S CONCEPTION OF THE NEW QUARTERS OF THE VIRGINIA FISHERIES LABORATORY UNDER CONSTRUCTION AT GLOUCESTER POINT, VA.

EXHIBIT B

VIRGINIA FISHERIES LABORATORY OF THE COLLEGE OF WILLIAM AND MARY AND THE COMMISSION OF FISHERIES OF VIRGINIA

BOARD OF ADMINISTRATION

JOHN E. POMFRET.....*President of the College of William and Mary*
CHARLES M. LANKFORD, JR.....*Commissioner of Fisheries*
DONALD W. DAVIS.....*Head, Department of Biology, College of William and Mary*
JAMES B. MARTIN.....*Associate Commissioner of Fisheries*
NELSON MARSHALL.....*Secretary*

STAFF

NELSON MARSHALL, Ph.D.....*Director and Biologist*
DENNIS K. COGLE, B.A.....*Administrative Assistant*
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CHESAPEAKE BAY INSTITUTE

Sponsored by

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And the Executive Committee

REPORT FROM THE VIRGINIA FISHERIES LABORATORY TO THE COMMISSION OF FISHERIES OF VIRGINIA FOR THE PERIOD JUNE 1947 THROUGH SEPTEMBER 1949

To the HONORABLE CHARLES M. LANKFORD, JR.
Commissioner of Fisheries
Newport News, Virginia

From NELSON MARSHALL
Director of the Virginia Fisheries Laboratory
Yorktown, Virginia

INTRODUCTION

As our studies have progressed since my taking office in June 1947, I have looked forward to preparing this two-year report as a stepping stone and progress report of the Laboratory's activities. Now that I have accepted the position of Dean of the College of William and Mary this report becomes, in addition, a series of parting comments from my regime at the Laboratory. As I leave this post I wish to express my hope that it will be possible for me to assist in the further development of the Laboratory.

The Virginia Fisheries Laboratory can be represented best by some of the chief recommendations it has advanced within the last two years and by the major recommendations it now advances with respect to the future.

MAJOR RECOMMENDATIONS TO DATE

General.—To the writer it seems that the three greatest obstacles to the improved management of our fisheries are: (1) the lack of important basic knowledge; (2) the need for further public education to absorb what information is acquired; and (3) *the failure to analyze the true nature of conflicting fisheries interests.* The Laboratory is, of course, dedicated to overcoming the first two points. In addition, we have attempted wherever possible to stimulate a clearer analysis of fisheries questions. Accordingly, I proposed to the Chesapeake Bay Panel of the Atlantic States Marine Fisheries Commission that we discontinue reviewing all Bay problems as though conservation were on one side and the lack of such were on the other. Instead we should seek the true issues of a controversy, i.e., the social, economic, natural depletion, fisheries depletion, or other features that comprise the problem.

Nowhere is this approach more urgently needed than in the numerous Maryland-Virginia controversies.* Most of these controversies revolve around the problem of the fair sharing of the fishery resources. Among the people, however, Marylanders often accuse Virginians of poor conservation practices, and the latter draw back in defense. When a fish migrating into Chesapeake Bay from the ocean traverses Virginia waters, the people of that region want to catch him for themselves rather than let him pass and, as they see it, be taken up the Bay in Maryland. In this respect the relationship is not much different than that of a few hitch-hikers stretched out along a highway. The first in line does not turn his back to a potential ride to give the next hitch-hiker a greater chance. Obviously some fish must get by both the Virginia and Maryland nets if they are to spawn and maintain abundant populations of their own kind. Maryland has a management plan one purpose of which is to permit proper escapement but, when Maryland suggests more moderate fishing in the Virginia waters, Virginians want to know and have a right to know to what extent the motive is one of increasing escapement on a Bay-wide basis and how much it is a matter of letting more fish get into the Maryland nets. When we have as little data as we have today as to the quantity of breeding fish that must escape, it is very easy for even the best of thinkers on the Maryland side to exaggerate this need and for the best of thinkers on the Virginia side to minimize it. Meanwhile, the scientist has such limited information at this early stage of his work that he can seldom take a definite

*Marshall, Nelson, 1949.
Conflicting interests in marine fisheries. *Trans. 14th N. A. Wildlife Conf.*, pp. 429-440.

stand one way or another, though he may guide his people with due qualifications and precautions. It is certainly a problem of recognizing, facing, and studying the basis for different interests rather than trying in vain to establish a singleness of purpose.

Oysters.—In response to requests from the Commission of Fisheries the Laboratory has submitted recommendations for guidance in the shell plantings undertaken during the last two years. Prodded by his interest in such advisory work and by the preliminary results of his research, Dr. Jay D. Andrews of the Laboratory also offered a series of general repletion recommendations in December 1948. In these he attempted to formulate effective practices within the framework of the Commonwealth's prevailing "Baylor Survey policy" which sets aside the best areas for the public and permits private leasing and planting only on the grounds that remain. The essentials of Dr. Andrews' general recommendations are:

1. That a large portion of available shells be planted in seed areas (good setting areas) rather than growing areas (poor setting areas).
2. That no shells be planted on soft bottoms or drill infested bottoms at present since large areas of more suitable ground are available for repletion now.
3. That we strive to get shells planted as late as the month of June—provided shells are not lost to the State by such time limits.
4. That the most effective way of growing oysters on certain bars ("growing bars") is to transplant seed oysters.
5. That an accurate evaluation of repletion work will require careful marking of areas and data on the production of these areas.*

A more specific recommendation offered late in the fall of 1948 was to open the Corrotoman River† for seed oystering. It was hoped that this would initiate a practice of freeing more and more such areas for seed harvest while sustaining their good condition by continued shell repletion.

Oyster Drills.—This borer continued its threat to the oyster industry of certain areas, particularly the seaside of the Eastern Shore. A review of scientific and practical studies of this mollusk as a pest indicates that the drill can be controlled by various trapping, picking, screening and suction methods, all of which are expensive and thus unattractive to the oystermen. Our efforts have been directed toward indicating this to the industry, a rather negative offering not to be dignified by the heading recommendation. On the other hand, as I observe enterprising growers such as Henry M. Terry of Willis Wharf, who is studying publications on screening and trapping and developing an improved screening device for his own use, it appears that progress is being made.

Attempts to develop a chemical control of drills have been discouraging. Mr. Haven and others have tried an assortment of toxins in the Yorktown laboratory including parathion, DDT, benzene hexachloride (gamma isomer), tetraethylpyrophosphate, "Marlatte" 50, formaldehyde, nicotene sulphate, Santobrite, mercuric chloride, and lime. Though the drill seems unusually resistant, it can be poisoned. To date, however, a scheme for killing drills without widespread damage to oysters‡ and without general toxicity in surrounding waters has not been conceived. A chemical-physical approach worthy of further attention is that of artificial resistant coatings that might be applied to the shells of young oysters.

Blue Crab.—A cooperative research program on blue crab populations and factors affecting them is being pursued with the Chesapeake Biological Laboratory of Maryland. These studies are stimulated to a great degree by the earlier

*Prior to the planting of shells this past spring the Commission provided a means for marking these areas and surveying them in such a way that the Laboratory staff could check the exact location during successive years.

†The fishermen of the vicinity expressed strong opposition to this proposal and it was not put in effect.

‡The problem is quite different from the common agricultural problem of killing a plant-destroying insect. The drill and the oyster are so alike in physiology and feeding that it would really be surprising to find a poison affecting one and not the other; furthermore, in the water currents threaten to distribute poisons and thus extend destruction over wide areas.

investigations of John C. Pearson suggesting on the one hand that fishing intensity has little or no effect on abundance and on the other that the hydrographic conditions at critical times are very important. Such preliminary research suggests that perhaps we overrestrict and underfish this species but, since we must not hastily suggest the repeal of protective measures that have taken years to develop, we have recommended that the management regulations for this species simply remain as they are pending more knowledge.

In addition to these population studies, Mr. Van Engel of the Laboratory has cooperated with the Aerial Spray Unit of the Langley Air Force Base to study the effects of DDT spray on crabs in the marshes. The tests indicate that, though it does not kill crabs in shedding floats, the spray is somewhat lethal to crabs out in the marshes. This mortality apparently results from indirect exposures, perhaps from feeding rather than from contact. For the present the Base is tolerating the mosquito menace in preference to spraying over areas where fishermen have protested.

Shad.—In 1948 the U. S. Fish and Wildlife Service presented a preliminary study suggesting that shad in Virginia had declined because of overfishing. Further analysis of the data involved in this study has resulted in concurrence on the part of the Service's chief scientists and the Laboratory staff to the effect that the available facts do not show fishing mortality and thus do not demonstrate overfishing. We continue to stand, therefore, on our initial recommendation which was to the effect that the shad problem should not be handled as an overfishing problem unless and until it is shown to be such. Other threatening factors, for example dams, pollution, and siltation in spawning areas, should also be weighed as the cause for depletion is investigated.

In 1947 I was asked whether the Commonwealth should aid in the support of a hatchery at Fort Belvoir. A review of available records on shad hatcheries did not indicate population increases relating to hatchery output. Since a single roe shad may spawn 100,000 eggs, it is not surprising that the hatchery did not stand out above nature's output. Weighing these facts and the results of investigations on comparable situations, I advised against the support of such hatchery endeavors.

The North Carolina Shrimp Fishery.—Shrimp fishing inevitably kills great quantities of young fish; consequently, while such a fishery has been growing in North Carolina, many Virginians have expressed a fear this will destroy important stocks of fin-fish. Though not clearly demonstrated, it may well be that the North Carolina sounds are vital as nursery grounds for populations that later move into Virginia waters, etc.; however, before making accusations, it is imperative to recognize that the following vital questions are unanswered:

(1) what percent of the whole fin-fish population does this seemingly large waste actually represent?
(2) to what extent would these fin-fish have entered the harvest after such factors as natural mortality and intraspecies competition had taken their tolls?

In addition to these questions we must recognize that the shrimp fishery is of such value that minor reductions in fin-fish population, if such exist, may represent a sound economic sacrifice. We must also realize that, since the shrimp is evidently an efficient feeder capable of assimilating a higher proportion of the over-all productivity than many of the fish involved, to emphasize this crustacean at the expense of other forms may be sound resource use. Weighing all such factors we have not concurred with those who accuse the North Carolina shrimp practices of either gross or unwarranted destruction. We have, on the other hand, worked with the scientists of the Institute of Fisheries Research of the University of North Carolina in their plans for getting more data on the shrimp trawl effects.

Some Recommendations for the Future

General.—Extreme caution should be exercised in the adoption of measures restricting, in the name of conservation,* the methods of fishing and the size and quantity of fish taken. When a fishery is depressed or thought to be so there is a tendency to rally support for some new restriction since, out of the vast complexity of factors affecting aquatic populations, the catch is the only thing that vividly comes to man's attention and is "real" to him.

On writing this I must add that, except for upriver limitations on shad and herring fishing, I could not defend with tested facts any fishing restriction now applied to our migratory fin-fish and crabs. I am especially skeptical of the various minimum size limits. How can we, by rule of thumb, determine that we will harvest more fish under a minimum size limit of 15 inches as opposed to, let's say, 12 inches? We must first know how long it takes the fish to add the three inches in question and be able to deduct accurately the mortality rates during this period. The soundest procedure is to avoid all new regulations until pertinent facts are obtained. Actually, however, most of our regulations are the result of guesses in the strict sense of the word.

A person following this discussion literally might say, "let's scrap restrictive regulations". As was mentioned with respect to the blue crab fishery, this is too radical a venture. Perhaps we should eliminate as cautiously as I propose we add to our restrictions; yet I always leave this subject wondering why we are cautious in destroying something that is without foundation.

Recognize that the Abundance of Fish Naturally Fluctuates to a Pronounced Degree.—Science has clearly demonstrated that marine populations undergo great fluctuations in abundance. Unfortunately, however, the fishing industry tends to build to the peaks of such fluctuations resulting in a general weakness at other times and critical conditions during lows in abundance which, contrary to popular belief, seldom represent depletion. Maryland has faced this by restricting the amount of fishing gear, supposedly at a level suited to the average in the ever changing supply. The Maryland Management Plan is, theoretically at least, of great merit in this respect. If Virginia fishermen are opposed to such State restriction they must, instead, apply a degree of self-restraint in their enterprises. Since it is unlikely that all types of fisheries will be at a low at any time, diversity of fishing endeavor, as contrasted with over-specialization, is to be recommended.

Establish a Fisheries Statistics Program.—The activity most urgently needed for intelligent fisheries management in Virginia is an adequate fisheries statistics program. At present we have no statistical information on Virginia's fisheries other than the annual estimates made by one man instructed by the U. S. Fish and Wildlife Service to devote part of his time in this area. In other words we we have no records with which to develop a sound management program, which is in striking contrast with the situation in Maryland, for example, where catch records are obtained week by week, region by region, and gear by gear.

One of our former investigators, Mr. Edwin L. Cox, devoted his efforts to studying methods for a statistics program. He submitted his conclusions to a committee that was sponsored by the Advisory Council on the Virginia Economy to prepare a pattern for the much needed statistics work. This committee was headed by Clinton E. Atkinson of the U. S. Fish and Wildlife Service, assisted by Mr. Ralph C. Hammer of the Department of Tidewater Fisheries of Maryland, and Mr. Willard A. Van Engel of the Virginia Fisheries Laboratory. These scientists drew not only upon their experience in such work but on the advice of several consultants.

The program this group proposed has the unanimous approval of the Fisheries Research Committee of the Advisory Council on the Virginia Economy and has been submitted to the Council proper. One of the outstanding questions in the planning was that of designating the responsibility for the statistics program which appears to be a function of administration but a tool of research. The study

*It is recognized that measures may be adopted as a means of sharing the harvest among existing methods. Also this discussion does not apply directly to the many regulations involving licensing and other administrative procedures.

group decided that all but the enforcement features, which obviously come under the Commission of Fisheries, should be conducted as a division of the Virginia Fisheries Laboratory. The entire program would cost $60,000 annually—$10,000 for enforcement and $50,000 for the collection, study, and reporting of statistics. This would be a sizeable increase in expenditures but it should be considered as offsetting a major deficiency rather than as an addition to an established fisheries program.

Establish an Annual Biological Survey of the Public Oyster Rocks.—The Commonwealth of Virginia has over 95,000 acres of privately managed oyster grounds and 210,304 acres of public oyster grounds. According to figures of the U. S. Fish and Wildlife Service, the public grounds which produced an average of about five million bushels of market oysters annually around the turn of the century, now yield less than one million bushels per year. This tremendous decrease has been partly compensated for by an increase in the acreage of privately operated oyster grounds. However, even the private grounds are dependent upon the public grounds for a supply of seed oysters. Thus the whole oyster industry of Virginia is *directly dependent upon the welfare of the public oyster grounds.*

In recognition of this, the State is now spending about $57,000 a year adding shell to these public grounds as a repletion endeavor. Since oysters set and grow on such shell when properly placed, it is conservative to say that a bushel of shell may yield a bushel of seed and later a bushel of oysters, making a potential return of $2.00 for every $0.10 spent. In contrast, poorly placed shell may give no return and the chances of poor placement in our present comparatively "blind" procedures are greater than 50-50. For this reason a basic survey program, which if done at all will cost $32,000 annually, would be a very profitable investment and a reasonable one for an industry valued at $15,000,000 annually at the wholesale level. The plans for such an oyster survey program have been made and approved by the Fisheries Research Committee of the Advisory Council on the Virginia Economy.

Develop New Seed Oyster Areas.—It was stated above that there are now more than 95,000 acres of privately operated oyster grounds in Virginia. Though this leased acreage is still less than half the acreage in public grounds, it now produces far more market oysters than the latter (see Figure 1). The history of this indicates clearly that, under present practices, the industry's future lies in the continuing success of these private grounds. As stated above, however, these private grounds are dependent on the availability of seed oysters for planting. The harvest of seed from public rocks is now permitted from the James River seed areas and the seaside of the Eastern Shore but, since there are other areas capable of producing quantities of small oysters, more rocks should be opened for seed harvest as the biologists are able to designate suitable localities. There has been resistance on the part of local fishermen to earlier attempts to do this but we are confident that in the long run such a practice would bring great mutual benefit both to the tonger working public rocks and the private planter. If areas in several different localities were to be opened at one time the people of any one locality might be more receptive for they would not fear the prospect of so many tongers suddenly converging on their home waters and taking what they consider "their oysters".

Continue to Support the Studies Now Conducted by the Chesapeake Bay Institute.—The very simple concept that "weather under the water" undoubtedly bears a vital relationship to fisheries production, much as weather on land bears to agriculture, led to the founding of a greatly strengthened program of hydrographic studies in the past biennium. The Chesapeake Biological Laboratory of Maryland, the Office of Naval Research and the Virginia Fisheries Laboratory are each contributing $30,000 annually to this study which is conducted, as the Chesapeake Bay Institute, by contract with the Johns Hopkins University and by direction of an executive committee consisting of the director of the two state biological laboratories and the associate director in charge of the Institute. When conceived this hydrographic program was recognized as a long-term project requiring at least five years for results of consequence. It is now well staffed and operating efficiently. Results depend on continued pursuit of the research in progress.

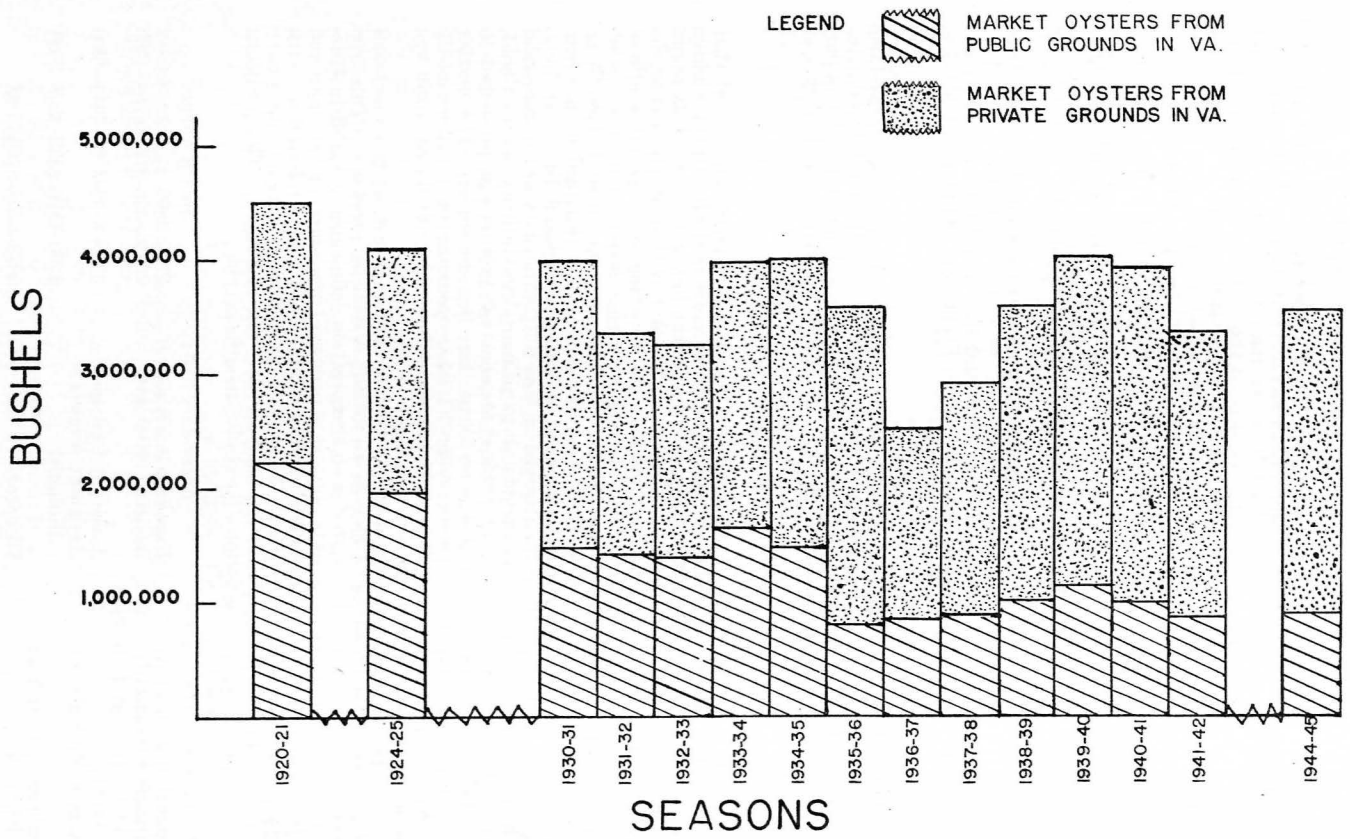

FIGURE 1.—TRENDS IN PRODUCTION OF MARKET OYSTERS FROM PUBLIC AND PRIVATE GROUNDS

Advisory Council on the Virginia Economy

As indicated elsewhere in this report the Fisheries Research Committee of the Advisory Council on the Virginia Economy has been of great help in our overall fisheries research efforts. I have been serving as chairman of this Research Committee, although I have openly questioned the advisability of this since one function of the committee is to scrutinize the Laboratory's efforts. This research committee is comprised of a very capable group of scientists from throughout the State plus two out-of-state contributors, the roll being as follows:

G. W. Buller, Chief, Division of Fish, Commission of Game and Inland Fisheries
Edwin L. Cox, Institute of Statistics, Raleigh, North Carolina (Resigned in May 1949 because of plans to leave the state)
Dr. Horton H. Hobbs, Associate Professor of Biology, University of Virginia
Frank H. Miller, Chief Engineer, Hampton Roads Sanitation District Commission
David H. Wallace, Chairman, Maryland Board of Natural Resources
Richard Whiteleather, Assistant Chief, Branch of Commercial Fisheries, U. S. Fish and Wildlife Service
Nelson Marshall, Chairman

In addition to its methods reports, one designing a statistics program and one an annual oyster survey as mentioned above, the Fisheries Research Committee of the Council has inaugurated a study of Virginia seafood marketing, being pursued by Professor Charles L. Quittmeyer of the College of William and Mary.

Personnel

At its meeting of March 30, 1949, the Board of Administration voted that the Virginia Fisheries Laboratory seek recognition as one of the institutions whose scientific staff is exempted from the regulations of the Personnel Act. This would be in keeping with paragraph 8, Section 6 of the Act, which provides that the program shall not apply to "the presidents and teaching and research staffs of State educational institutions". It also complies with a memorandum on interpretation of the Act written by the Director of Personnel September 1, 1946, from which the following is quoted: "The words 'educational institutions' are construed to mean the academic institutions whose primary responsibility is teaching, or research, or both, and not institutions such as the penitentiary or the industrial schools in which teaching is incidental to primary rehabilitory, correctional, punitive, or other purposes". A request for such recognition was presented to the Personnel Office which refused to accept the Board's views. The matter was not pressed further and remains somewhat of an open question that repeatedly comes to the fore because the provisions of the Personnel Act do not meet the problems of developing a research staff.

Compelled for the present to work within the framework of the Personnel Act, I asked the Personnel Office to study our scientists' positions. This was done in the fall of 1948. It resulted in clearer position definitions, valuable instruction to the Laboratory director in matters of personnel procedure, and an improved salary scale. The latter cut approximately in half what I have referred to, with supporting figures, as more than a $1,000 a year difference between our salary program and the salaries paid for comparable work elsewhere. The positions as now established pay as follows for twelve months service:

Personnel Office Title	*Laboratory Title*	*Salary Range*
Aquatic Biologist A	Research Assistant	2772–2892–3120–3336–3552
Aquatic Biologist B	Assistant Biologist	3336–3552–3768–3984–4200
Aquatic Biology Extension Agent	Assistant Biologist	3336–3552–3768–3984–4200
Aquatic Biologist C	Assistant-Associate Biologist	4200–4416–4632–4848–5064
Fisheries Laboratory Director	Director	6072–6408–6780–7098

Another personnel step of great significance during the past year was the establishment of an administrative assistant position. With this position filled, the director of the Laboratory has been able to devote far more time to service as a scientist and with the new administrative services the Laboratory as a whole has been able to accomplish more due to the greater coordination of effort.

We have been fortunate in the general building and strengthening of our staff. Mr. William H. Massman joined us in the summer of 1948 and was soon bearing the major share of our shad research. Mr. John Thornton Wood was added next to take the leadership in our public education pursuits. This spring we added Mr. Dexter Haven who is conducting chemical tests for possible drill control methods, and is studying croaker populations. In addition two of the graduate students and one faculty member from the College of William and Mary are engaged in research at the Laboratory. As a common ground for our personnel, our students, and our college faculty associates to get together on scientific problems we now have a prospering Aquatic Biology Seminar meeting every other week.

Building Program and Finances for the Fiscal Year July 1, 1948-June 30, 1949

The urgent need for suitable working quarters will soon be met as a result of progress on building plans during the past year. A waterfront site of approximately two acres was purchased at Gloucester Point. This land will accommodate the first units of the physical plant and could accommodate later units such as are anticipated at this time, though it would be preferable to purchase adjacent property to the west if there is to be any expansion. We have thus acquired a site with excellent water conditions for our work, offering reasonable opportunity for future development, and as convenient to the Commission of Fisheries and the College of William and Mary as is possible in view of the many physical requirements.

The services of Robert J. Leary, architect of Richmond, were engaged for the development of building plans. On reviewing his preliminary study, the Laboratory's Advisory Group requested an additional $75,000 to supplement the $50,000 originally appropriated for construction. Governor Tuck honored this request and instructed the director of the Laboratory to design a first-class marine laboratory. The bids on construction ran the total cost of the project up to $157,000 or $32,000 in excess of the funds available. This was provided by the authorization of a deficit and construction is now well underway.

Funds other than those involved in the building program fall under two headings, one of which is a $30,000 annual appropriation for hydrographic studies. This was consigned to the Johns Hopkins University under the contract mentioned above for the operation of the Chesapeake Bay Institute. Under the other heading of general operations the appropriations for the year totalled $46,997, the expenditures $47,328. Of the expenditures $31,405 was for personal service.

As of July 1, 1948,* and with the appointment of an administrative assistant, the direct handling of fiscal affairs was transferred from the offices of the Commission of Fisheries to the Laboratory proper. This move has enabled the Laboratory to function with a greater awareness of its finances and thus a far more efficient utilization of its resources.

Respectfully submitted,

Nelson Marshall

*It is because of this change that this report does not account for funds spent prior to July 1, 1948. The fiscal services rendered by the Commission staff, particularly Wilbur F. Yarrington, prior to this transfer are greatly appreciated.